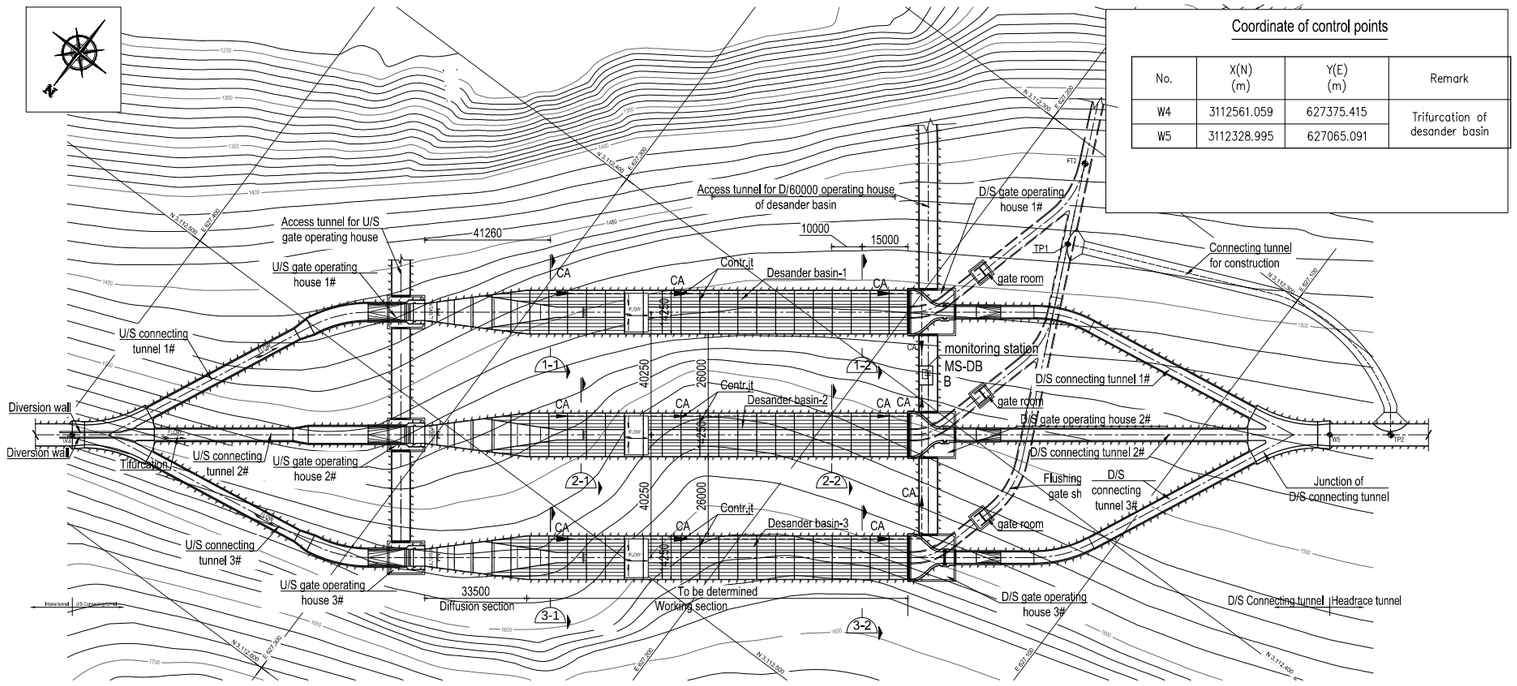
MONITORING PLAN LAYOUT OF DESANDER BASIN

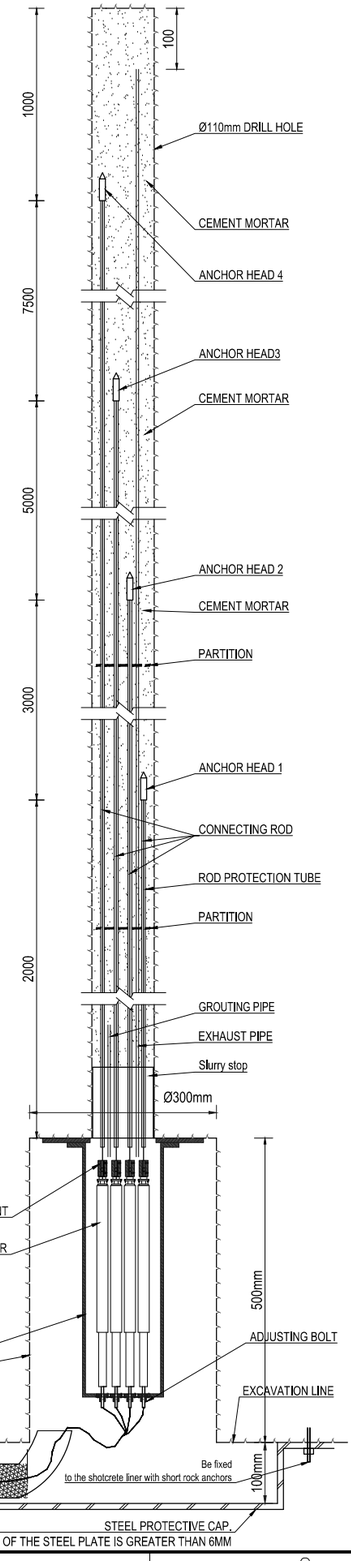
1:1000



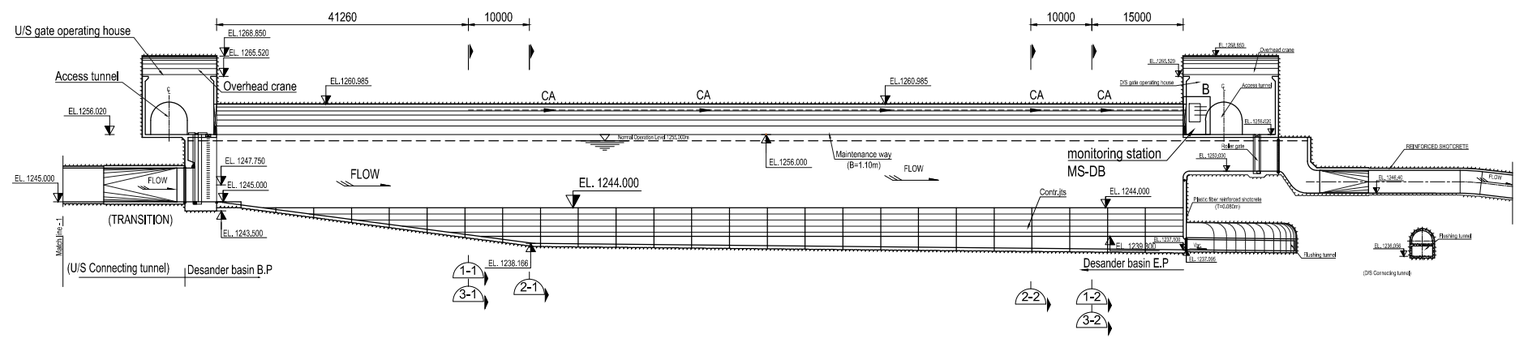
Coordinate of control points

No.	X(N) (m)	Y(E) (m)	Remark
W4	3112561.059	627375.415	Trifurcation of desander basin
W5	3112328.995	627065.091	

SCHEMATIC DIAGRAM OF MULTI-POINT EXTENSOMETER



MORNITORING GENERAL PROFILE OF DESANDER BASIN-1(2/3)



OBSERVATION INSTRUMENT EQUIPMENT LIST

NO.	NAME	LEGEND	SYMBOL	QUANTITY	UNIT	REMARK
1	Multi-point extensometer		ME4	10	SET	Vibrating wire displacement transducer,Range 100mm,Resolution0.025%F.S..Including sensor, connecting rod, rod protection tube, anchor head, partition plate, instrument base and other orifice devices.
2	Hole for rock Multi-point extensometer			185	m	Borehole diameter Ø110mm, single hole depth18.5m,including backfill grouting.
3	Cable for vibrating wire type		CA	2980	m	10 core, galvanized copper wire.Include Multi-point extensometer and Anchor dynamometer(Load cell).
4	Single point borehole extensometer(SBPX)		MD	8	m	Unbonded elastic wire resistance type ,Measuring range: 40mm; Resolution: 0.1% F.S;Including sensor, connecting rod, rod protection tube, anchor head, partition plate, instrument base and other orifice devices.
5	Hole for Single point borehole extensometer			84	m	Borehole diameter Ø90mm, single hole depth 10.5m,max.20.5m,including backfill grouting.
6	Cable for unbonded elastic wire resistance type		CA	1400	m	
7	Anchor dynamometer(Load cell)		PA	6	set	Vibrating wire instrument,Range 400kN,Resolution0.03%F.S..,3wires.
8	Convergent measuring point (Optical targets)			262	set	The number of measuring points shall be calculated according to the monitoring section.
9	Hub box		B	4	set	Allow access to 20 instruments,Protect with a homemade protective box.
10	Cable protection tube			960	m	50mm-100mm diameter,thick and flexible PVC/rubber pipes.

NOTE

1. This set of drawings is the monitoring layout of desander basin.
2. All dimensions are in millimeters, and coordinates, chainage and elevation are in meters. The rest shall be subject to the figure.
3. Layout drawing of desander basin is subject to the drawing UT1-C-030-CVL-DG-52001.
4. A convergence monitoring section is arranged every 10 meters along the axial direction of the desander basin.Technical requirements of convergence monitoring, please refer to UT1-C-845-CVL-DG-70006.
5. Besides deep deformation & convergence measurement, other monitoring items such as stress meters, load cells ,can be carried out as per actual conditions and request of Employer or onsite OE during tunnel construction.
6. All cables are protected by steel pipes.Attention shall be paid to prevent cables from being damaged during construction.
7. The monitoring station of desander basin is arranged at the Access tunnel for D/S gate operating house. As shown in the drawing.

Scale:

1:1000 0 10 20 30 40 50m

1:500 0 5 10 15 20 25m

REFERENCE DRAWINGS

UT1-C-030-CVL-DG-52001	LAYOUT DRAWING OF DESANDER BASIN
UT1-C-845-CVL-DG-70006	LAYOUT DRAWING OF MONITORING FOR INVESTIGATION TUNNEL

SYMBOL AND LEGEND

FOR CONSTRUCTION

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REV. NO.	DATE	DESCRIPTION	DRAWN	CHKD.	APPD.
0	15.Dec.2022	As RN-0361	CUI J.W.	YUAN Q.S.	LI W.G. CHEN S.L.
0B	17.Oct.2022	As RN-0291	CUI J.W.	YUAN Q.S.	LI W.G. CHEN S.L.
0A	12.Sep.2022	FIRST ISSUE	CUI J.W.	YUAN Q.S.	LI W.G. CHEN S.L.

PROJECT TITLE

Upper Trishuli-1 HEP (216MW)

OWNER

NWEDC

OWNER'S ENGINEER

TRACTEBEL ENGIE

jade CONSULT

CONTRACTOR

DOOSAN Enerbility

DRAWING TITLE

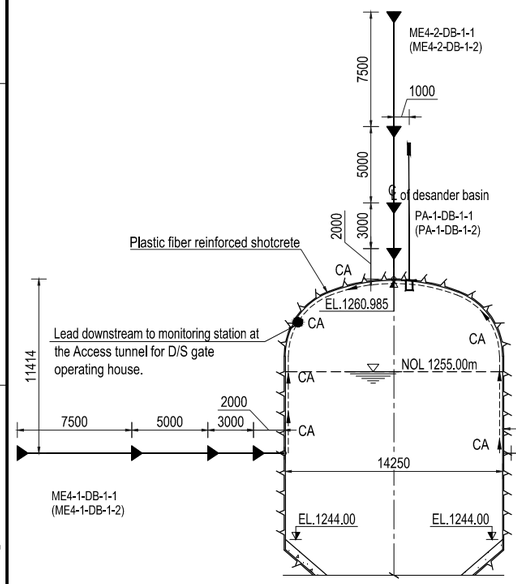
MONITORING LAYOUT DRAWING OF DESANDER BASIN

INDEX	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-845-CVL-DG-70011	1 OF 2	0

A1 (594 x 841 MM)

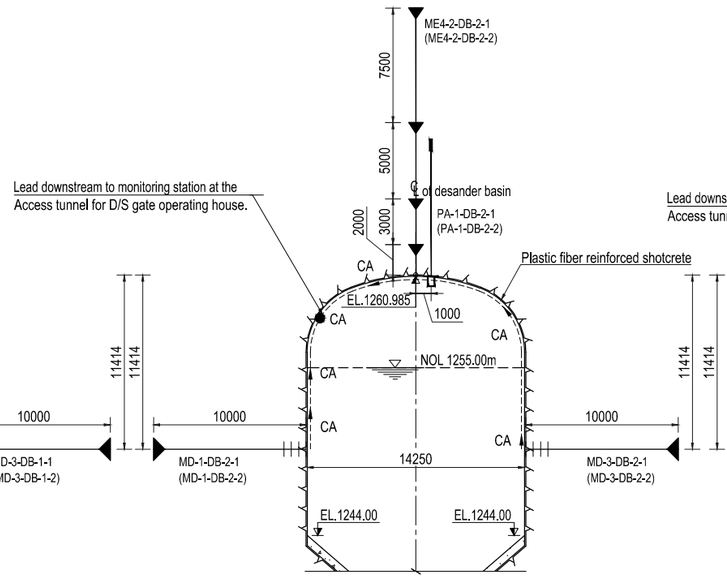
SECTION 1-1(1-2/)

1:200



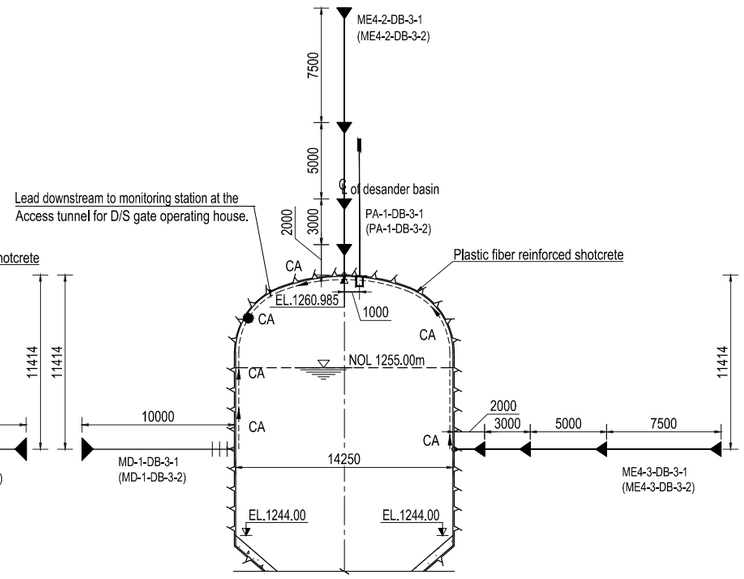
SECTION 2-1(2-2)

1:200

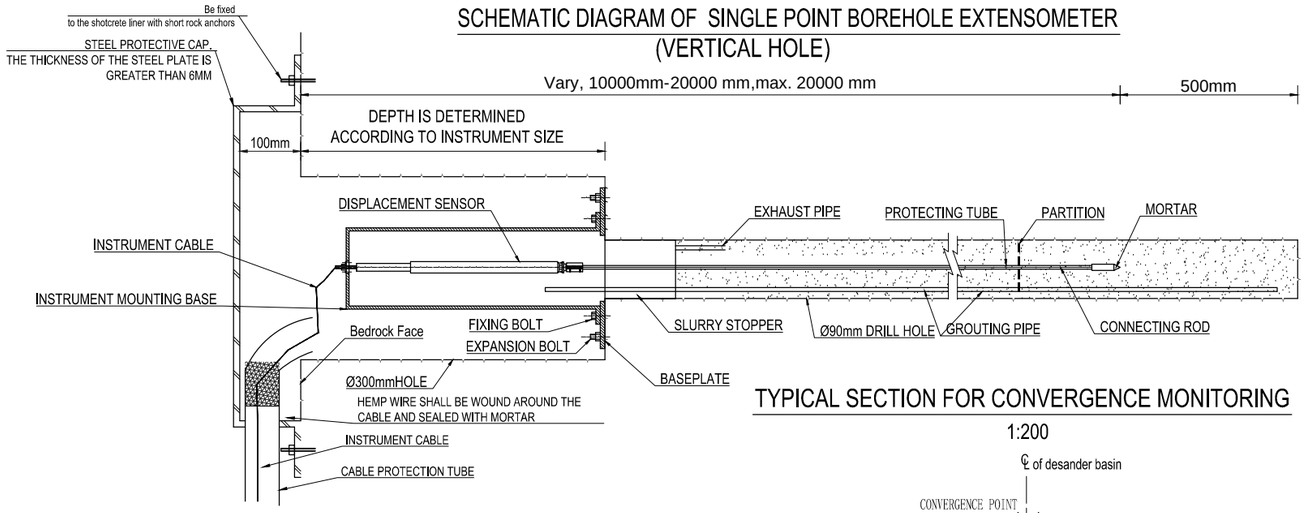


SECTION 3-1(3-2)

1:200

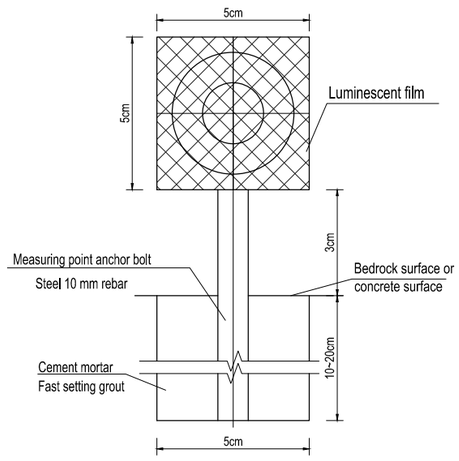


SCHEMATIC DIAGRAM OF SINGLE POINT BOREHOLE EXTENSOMETER (VERTICAL HOLE)



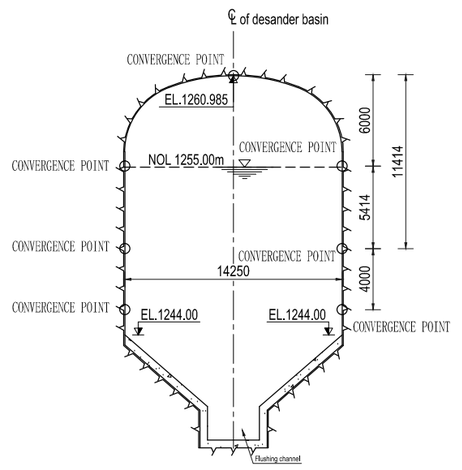
SKETCH OF CONVERGENCE MONITORING REFLECTOR

(TOTAL STATION REFLECTOR)



TYPICAL SECTION FOR CONVERGENCE MONITORING

1:200



Technical requirements of multi-point extensometer

1. When the position of the Multi-point extensometer conflicts with that of the anchor bolt, the position of the multi-point displacement meter can be adjusted within 2m.
2. The hole wall of the multi-point extensometer is smooth,the bending degree of the axis should be less than the radius of the hole,the deviation of the whole hole (compared with the design value)should be less than 1,and the hole mouth should be stable and smooth
3. The hole should be expanded from 50cm deep to 300mm in order to facilitate the installation and protection of the sensor at the end of the multi-point extensometer.
4. After drilling,it should be washed (blown by high pressure wind),checked the unobstructed condition of drilling,and measured the depth,orientation and inclination Angle of drilling.
5. The drilling conditions should be recorded in the process of drilling to understand the geological conditions of surrounding rock and facilitate the accurate positioning of anchor head of multi-point extensometer.
6. The joint between the protective pipe and the joint between the protective pipe and the anchor head must be sealed.Bind the assembled multi-point extensometer.grouting pipe and exhaust pipe segment by segment,and mark each meter of protective tube with colored adhesive tape,and then slowly feed into the hole. The grouting pipe of the vertical hole and the upward hole is at the mouth of the hole, and the exhaust pipe is at the bottom of the hole. The grouting pipe of the horizontal hole is at the lower part of the hole, and the exhaust pipe is at the upper part of the hole.
7. Backfill grouting should ensure full grouting of borehole.w/c-ratio of grout is 0.5:1 or 0.6:1.Grouting can be suspended after the exhaust pipe discharge thick slurry.Grouting can be done again after 15 minutes,and the grouting pipe will be tied to close the grouting after the exhaust pipe has discharged the thick slurry again.
8. To confirm functionality of extensometer, a reading shall be performed directly after grout setting,24 hours after the final grout setting.fix the sensor device,draw out the cable,install the protective cover and hole protection cover,and obtain the initial reading.
9. After installation,spray the instrument number on the steel cap\ concrete or rock near the measuring point with red paint.

NOTE

1. This set of drawings is the monitoring layout of desander basin.
2. All dimensions are in millimeters, and coordinates, chainage and elevation are in meters. The rest shall be subject to the figure.
3. The sections will be arranged as indicated above and shown in drawing UT1-C-845-CVL-DG-70011 (Sheet 1 of 2). In addition, the extensometer sections will also be monitored with optical targets as shown. Here, the targets will be adjusted to the locations of the extensometers.
4. Other see sheet1.

Scale:

1:200 0 2 4 6 8 10m

REFERENCE DRAWINGS

UT1-C-030-CVL-DG-52001	LAYOUT DRAWING OF DESANDER BASIN
UT1-C-845-CVL-DG-70006	LAYOUT DRAWING OF MONITORING FOR INVESTIGATION TUNNEL

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